TRICYCLE

The present application is a Continuation-in-Part of our application titled "Tricycle", Serial No. 10/226,264, filed August 23, 2002, which is a Continuation-in-Part of Serial No. 10/171,436, filed June 13, 2002.

BACKGROUND OF THE INVENTION

Field of the Invention

The present invention relates generally to human powered vehicles and, more specifically, to a new and novel tricycle with an adjustable linkage for varying the drive power for either foot or hand power. Furthermore, the linkage can also be used to vary the wheelbase. Moving the front wheel toward the rear wheels provides for a tighter turning radius. Moving the front wheel away from the rear axle provides for greater stability at high speed. In addition, the linkage provides for the selective placement along a horizontal and/or vertical plane relative the seat allowing persons of varying size to comfortably position the drive mechanism.

Additionally, the present invention has a cantilevered seat with the seat at one distal end and the other forming a yoke connected to the front wheel steering column whereby left movement of the seat results in a right turn of the front wheel and a right movement of the seat results in a left turn of the front wheel.

DESCRIPTION OF THE PRIOR ART

The prior art related to human powered vehicles includes numerous examples of various types of wheeled vehicles. However, despite the developments of the prior art, while these devices may be suitable for the purposes for which they were designed, they do not provide the range of functional capabilities provided by the present invention.

SUMMARY OF THE PRESENT INVENTION

The present invention discloses a new and novel tricycle with adjustable linkage for varying the drive power for either foot or hand power. Furthermore, the linkage can also be used to vary the wheelbase. Moving the front wheel toward the rear wheels provides for a tighter turning radius. Moving the front wheel away from the rear axle provides for greater stability at high speed. In addition, the linkage provides for the selective placement along a horizontal and/or vertical plane relative to the seat allowing persons of varying size to comfortably position the drive mechanism. Additionally, the present invention has a cantilevered seat with the seat at one distal end and the other end forming a yoke connected to the front wheel steering pivot column whereby left movement of the seat results in a right turn of the front wheel and a right movement of the seat results in a left turn of the front wheel.

A primary object of the present invention is to provide a human powered vehicle having linkage means for varying the position of the guide wheel and drive mechanism.

Another object of the present invention is to provide a human powered vehicle having means for adjusting the backrest of the seat in a vertical movement.

Yet another object of the present invention is to provide a human powered vehicle having means for adjusting the inclination of the backrest of the seat.

Still yet another object of the present invention is to provide a human powered vehicle where the drive mechanism can be positioned whereby the rider can use their hands to power the vehicle.

Another object of the present invention is to provide a human powered vehicle where the guide wheel can be moved closer to or further from the rear axle.

Another object of the present invention is to provide a human powered vehicle having a cantilevered seat forming a yoke for the drive column at one distal end.

Another object of the present invention is to provide a human powered vehicle where the rider can steer the guide wheel by means of the seat by shifting their weight left and right.

Another object of the present invention is to provide a human powered vehicle in which the camber angle of selected wheels can be easily adjusted.

Yet another object of the present invention is to provide a human powered vehicle which can be easily folded into a compact configuration for storage.

Additional objects of the present invention will appear as the description proceeds.

The present invention overcomes the shortcomings of the prior art by providing a tricycle with an adjustable linkage for varying the drive power for either foot or hand power. Furthermore the linkage can also be used to vary the wheelbase. Moving the front wheel toward the rear wheels provides for a tighter turning radius. Moving the front wheel away from the rear axle provides for greater stability at high speed. In addition, the linkage provides for the selective placement along a horizontal and/or vertical plane relative the seat allowing persons of varying size to comfortably position the drive mechanism.

A cantilevered seat with the seat at one distal end and the other forming a yoke connected to the front wheel steering column allows the rider to steer the vehicle by moving the seat literally.

Additionally, adjustment members are provided which facilitate adjustment of the camber angle of the rear wheels. This adjustment enables a rider to adjust the riding characteristics of the apparatus to suit varying conditions of terrain and operating speed.

The various linkages, joints and members of the apparatus facilitate folding the apparatus into an extremely compact configuration for the purposes of storage and transportation of the apparatus in the trunk of an automobile.

The foregoing and other objects and advantages will appear from the description to follow. In the description, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration specific embodiments in which the invention may be practiced. These embodiments will be described in sufficient detail to enable those skilled in the art to practice the invention, and it is to be understood that other embodiments may be utilized and that structural changes may be made without departing from the scope of the invention. In the accompanying drawings, like reference characters designate the same or similar parts throughout the several views.

The following detailed description is, therefore, not to be taken in a limiting sense, and the scope of the present invention is best defined by the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

In order that the invention may be more fully understood, it will now be described, by way of example, with reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a tricycle made according to the present invention;

Fig. 2 is an exploded view of the two main parts of the tricycle;

Fig. 3 is a perspective view of the steering operation of the tricycle;

Fig. 4 is another perspective view of the steering operation of the tricycle;

Fig. 5 is a close-up view of the joints around the front wheel;

Fig. 6 is an exploded view of the front joints;

Fig. 7 is a side view of the tricycle;

Fig. 8 is a diagram of a pivoting movement of the front wheel;

Fig. 9 is a diagram of a pivoting movement of the front wheel;

Fig. 10 is a diagram of a pivoting movement of the pedal assembly;

Fig. 11 is a diagram of a pivoting movement of the pedal assembly;

Fig. 12 is a diagram of a sliding movement of the front wheel;

Fig. 13 is a perspective view of the tricycle with the pedal assembly fully extended forward;

Fig. 14 is a perspective view of the tricycle with the pedal assembly pulled up close to hand pedaling;

Fig. 15 is an exploded view of the pedal and chain support arm assemblies;

Fig. 16 is a side view of the front wheel and pedal assembly in which the chain support arm assembly is relaxed for maximum extension of the drive chain;

Fig. 17 is the same view of the front wheel and pedal assembly in Fig. 16 with the chain support arm assembly tightened;

Fig. 18 is an exploded view of the back seat assembly;

Fig. 19 is a perspective view of the tricycle with the back seat tilted back;

Fig. 20 is a side view of the tricycle with the seat assembly lifted up;

Fig. 21 is a view of an alternate seat;

Fig. 22 is a view of an alternate seat in moveable positions;

Fig. 23 is an enlarged, simplified and perspective fragmentary view of another alternate embodiment of the invention showing links which facilitate adjustment of ground clearance and adjustment of the camber angle of the rear wheels;

Fig. 24 is a simplified fragmentary perspective view of the embodiment of Fig. 23 showing a shock absorber for the rear wheels;

Fig. 25 is a fragmentary top view of the embodiment of Fig. 23 showing the start of the process of folding the tricycle;

Fig. 26 is a fragmentary top view similar to Fig. 25 showing the continuation of the process of folding the tricycle; and

Fig. 27 is a simplified schematic front view of the tricycle of Fig. 23 with the tricycle shown in the folded configuration.

Fig. 28 is a schematic side elevation view of an alternative embodiment of the tricycle of Fig. 1 which incorporates a set of gears to connect the front fork and the seat;

Fig. 29 is a fragmentary plan view taken along the line 29-29 of Fig. 28;

Fig. 30 is a fragmentary cross-sectional view taken along the line 30-30 of Fig. 29;

Fig. 31 is a fragmentary bottom plan view the frame of the embodiment shown in Fig. 28 taken along the line 31-31 of Fig. 28;

Fig. 32 is a rear elevation view taken along the line 32-32 of Fig. 28;

Fig. 33 is a schematic side elevation view of another alternative embodiment of the tricycle of Fig. 1 which incorporates a pair of links connecting the front fork and the seat;

Fig. 34 is a fragmentary plan view taken along the line 34-34 of Fig. 33;

Fig. 35 is a fragmentary bottom plan view taken along the line 35-35 of Fig. 33;

Fig. 36 is a schematic side elevation view of another alternative embodiment of the tricycle of Fig. 1 which incorporates a downwardly directly front fork;

Fig. 37 is a fragmentary elevation view partially in section taken along the line 37-37 of Fig. 36 showing the frame and the front fork;

Fig. 38 is a schematic side elevation view of another alternative embodiment the tricycle of Fig. 1;

Fig. 39 is a fragmentary plan view taken along the line 39-39 of Fig. 38; and

Fig. 40 is a schematic side elevation view of yet another alternative embodiment of the tricycle of Fig. 1 which incorporates gas springs.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

The following discussion describes in detail one embodiment of the invention (and several variations of that embodiment). This discussion should not be construed, however, as limiting the invention to those particular embodiments, practitioners skilled in the art will recognize numerous other embodiments as well. For a definition of the complete scope of the invention, the reader is directed to the appended claims.

Turning to Fig. 1, shown therein is a perspective view of the tricycle of the present invention 10. Shown is the present invention 10 with the derailleur line and the brake lines removed for a clearer view. The sprockets 12 and the derailleur are installed in the front wheel 14. The pedal assembly 16 is positioned over the front wheel 14 to drive it. The front wheel 14 and the pedal assembly 16 can be repositioned using various joints. Also shown are the handle assembly 18 and a pair of foot rests 20, a pair of rear wheels 22, a bottom seat 24 and a back seat 26.

Turning to Fig. 2, shown therein is an exploded view of the two main parts, the rear main frame 28 and front wheel assembly 36, of the tricycle of the present invention 10. The main frame 28 of the tricycle 10 holds the two rear wheels 22 on the ends of axle 23 and has a tongue-like member 25 thereon. The seat frame 30 holds the seats 24, 26 and is pivotably at 69 attached to the seat frame clamp 32, which is rigidly fixed to the steering pivot column 34 and the front wheel assembly 36. These two components, the rear main frame 28 and the front wheel assembly 36, are pivotably engaged to form the tricycle. Also shown are the pedal assembly 16, handle assembly 18, foot rest 20, steering pivot slot 38, and drive chain 40.

Turning to Fig. 3, shown therein is a perspective view of the steering operation of the tricycle of the present invention 10. Steering is accomplished by a user applying torque to the front wheel assembly 36 and seat assembly 42 with bottom seat 24 and back seat 26 by pushing the handles of handle assembly 18 with the hands while pedaling with the feet. Alternatively, the steering torque can also be applied by pushing the foot rests 20 with feet while pedaling with the hands. In Fig. 3, the tricycle is turning to the left.

Turning to Fig. 4, shown therein is a perspective view of the tricycle of the present invention with the tricycle turning to the right. Fixed to the main frame 28 are the handle assemblies 18 and the foot rests 20 which provide the leverage needed to apply the steering torque to the front wheel assembly 36 and seat frame assembly 42 with bottom seat 24 and back seat 26 attached thereto.

Turning to Fig. 5, shown therein is a close-up view of the joints associated with the front wheel 14. Extending downward from the two radially extended opposed arms 35 on the lower end of the steering pivot column 34 are two, a right and a left,

symmetrical primary extension clamps 44, pivoting around the axis A. Joined to these are the pedal extension clamps 48 (only right side shown) and the front wheel columns 52, pivoting around the axis B. The pedal columns 54 are attached to the pedal extension clamps 48, pivoting around the axis C. The front wheel 14 is attached to the front wheel arm 56 by the front wheel axle 58. The front wheel arm 56 is attached to the front wheel arm clamp 60, which is slidably clamped to the front wheel columns 52. The entire front wheel assembly and pedal assembly, therefore, pivot around the axis A. The front wheel 14 can also pivot around the axis B independently as well as slide along the front wheel columns 52. The pedal assembly (not shown) can pivot around the axes B and C without affecting the front wheel 14. Also shown are the main frame 28 rotatably disposed on the steering pivot column 34 and seat frame 30. The pivot joints A, B and C are fixedly pivotable having means for being fixed such as fastening, clamping or locking means 37 as shown.

Turning to Fig. 6, shown therein is an exploded view of the front joints as previously disclosed. The front joints in Figure 5 are exploded and shown from the left side (of a rider). All of the extension clamps, columns and arms are positioned and moved and operated symmetrically on both the left and right sides. Also shown is the pedal U-fork 62.

Turning to Fig. 7, shown therein is a side view of the tricycle 10. Clearly seen are the primary extension clamps 44 and the front wheel columns 52 stemming from the steering pivot column 34. These extension clamps 44 and columns 52 can be independently adjusted for optimum position of the front wheel 14. Also shown is the seat frame pivot 64. Other elements previously disclosed are also shown.

Turning to Fig. 8, shown therein is a diagram of a pivoting movement of the front wheel 14. The diagram shows the pivoting movement of the front wheel 14 in a vertical plane around the pivot axis A. This pivoting movement rotates the entire wheel assembly 36 and the pedal assembly 16 as one body along the longitudinal axis of the vehicle.

Turning to Fig. 9, shown therein is a diagram of a pivoting movement of the front wheel 14. The diagram shows the pivoting movement of the front wheel assembly 36 around the pivot axis B. The pivot axis B can be used to rotate the front wheel assembly 36 and the pedal assembly 16 independently or together. This movement is in the vertical plane along the longitudinal axis of the vehicle.

Turning to Fig. 10, shown therein is a diagram of a pivoting movement of the pedal assembly 16. The diagram shows the pivoting movement of the pedal assembly 16 around the pivot axis B. The pivot axis B can be used to rotate the front wheel assembly 36 and the pedal assembly 16 independently or together. This movement is in the vertical plane along the longitudinal axis of the vehicle.

Turning to Fig. 11, shown therein is a diagram of a pivoting movement of the pedal assembly 16. The diagram shows the pivoting movement of the pedal assembly 16 around the pivot axis C. The pivot axis C is used to change the pedal assembly 16 without affecting the front wheel assembly 36. This movement is in the vertical plane along the longitudinal axis of the vehicle.

Turning to Fig. 12, shown therein is a diagram of a sliding movement of the front wheel assembly 36. This diagram shows the front wheel arm clamp 60 sliding along the front wheel column 52 carrying the front wheel assembly 36 with it. This movement is in the vertical plane along the longitudinal axis of the vehicle.

Turning to Fig. 13, shown therein is a perspective view of the tricycle 10 with the pedal assembly 16 fully extended forward for foot peddling. All three pivot axes A, B and C as shown in Figures 5 and 6 can be used to position the pedal assembly 16 in a comfortable and functional position. Shown here is the pedal assembly 16 fully extended out to the front for comfortable pedaling by the feet. The pedal U-fork 62 allows the pedal assembly 16 to be tilted deep into the forward position. The chain support arm assembly 66 is rotated counterclockwise to keep the drive chain 68 taut or tight.

Turning to Fig. 14, shown therein is a perspective view of the tricycle 10 with the pedal assembly 16 pulled up close for hand pedaling. When pedaling is done by hand, the rider's feet are on foot rests 20 and provide necessary torque for steering. The chain support arm assembly 66 is relaxed for the drive chain 68 to be stretched upward. The chain support arm assembly 66 works in conjunction with the derailleur assembly 70 in making sure that the drive chain 68 is always properly tensioned.

Turning to Fig. 15, shown therein is an exploded view of the pedal assembly 16 and chain support arm assemblies 66. The pedal assembly 16 and the chain support arm assembly 66 are rotationally inserted into the pedal clamp 72, thereby sharing the same axis of rotation. The body of the chain support arm assembly 66 comprises the roller arm body 74 fixed to the chain guard 76. A chain roller 78 on a roller pin 80 is rotationally fixed at the ends of each of the two roller arms 74. The chain support arm 66 employs means to fix it in position once adjusted.

Turning to Fig. 16, shown therein is a side view of the front wheel 14 and pedal assembly 16 in which the chain support arm assembly 66 is relaxed for maximum extension of the drive chain 68. The chain support arm assembly 66 and the pedal

assembly 16 share a common axis of rotation. The chain support art assembly 66 can be fixed in position frictionally or by spring tension.

Turning to Fig. 17, shown therein is the same view of the front wheel 14 and pedal assembly 16 in Figure 16 with the chain support arm assembly 66 tightened. Turning the chain support arm assembly 66 counterclockwise tightens the drive chain 68. This is shown in this Figure with the pedal assembly 16 in the same position as in Figure 16 for comparison. Tightening the drive chain 68 and lowering of the pedal assembly 16 will usually be done in conjunction.

Turning to Fig. 18, shown therein is a perspective view of the back seat assembly 42. The tricycle is shown here without the wheels for a clearer view. The back seat frame 84 with back seat 26 attached thereto is inserted into the back seat column 86, which is pivotably joined to the back seat extension clamp 88. The back seat extension clamp 88 is, in turn, pivotably connected to the seat frame 30. This configuration comprises two back seat joints 90 for adjusting the back seat 26.

Turning to Fig. 19, shown therein is a perspective view of the tricycle 10 with the back seat 26 tilted back. The tricycle 10 is shown here with the back seat 26 titlted back for a comfortable recumbent riding. Besides changing the angle of the back seat 26, the two back seat joints 90 can be used in unison to bring the back seat forward and back. Also shown is bottom seat 24.

Turning to Fig. 20, shown therein is a side view of the tricycle 10 with the seat assembly 42 lifted up. The seat frame 30 is pivotably attached at 64 to the seat frame clamp 32, thereby allowing the seat assembly 42 to be lifted up. The seat frame clamp 32

itself is ridigly fixed to the steering pivot column 34. Also shown are the back seat 26, main frame 28 and seat frame pivot 64.

Turning to Fig. 21, shown therein is a view of an alternate seat design. The tricycle of the present invention can be provided with alternate style seats 24, 26 as the one illustrated.

Turning to Fig. 22, shown therein is an alternate seat 24, 26 in movable positions. Figure 22 is an illustrative view of an alternate seat 24, 26 of the present invention showing the moveability of the seat 24, 26 as it rides within a slide retainer 92 attached to the rear axle 23. Seats 24, 26 are fixed together and partially rotate in a vertical plane perpendicular to the longitudinal axis of the vehicle.

Turning to Figs. 23-27, there is shown therein an alternative embodiment 100 of the tricycle which incorporates a capability for adjusting the road clearance, adjusting the camber angle of the rear wheels 102, 104, and for folding the tricycle 100 into a compact configuration.

Fig. 23, which is a view looking toward the rear of the triangle 100, shows that the axle 106 has a step portion 108 which includes the flat portion 110. The step portion 108 supports a lockable pivot 112 which is connected to a link 114. The link 114 may be adjusted in the directions shown by the arrows 116, 118 to adjust the ground clearance of the tricycle 100. This feature enables a user to easily accommodate various road conditions such as rough off-road conditions, smooth pavement and various degrees of intermediate road conditions.

The outer end 120 of the link 114 includes a lockable pivot 122 which connects the link 114 and the block 124. The lockable pivot 122 facilitates adjustment of the

camber angle or angle of the wheel 102 relative to a vertical plane, in the directions shown by the arrow 126, 128. This adjustment enables a user to adjust the riding and stability characteristics of the tricycle 100 for special riding conditions such as racing.

The block 124 includes a lockable pivot 130 which enables the rear wheels 102, 104 to be folded into general alignment with the axle 106 as shown in Figure 25 for the purpose of folding the triangle 100 in a manner which will be presently described.

Fig. 24 shown the rear wheel shaft 132 being supported by a link 134 which is connected to the block 124 by means of the pivot 134.

The link 134 and the block124 are also connected by a shock absorber 138 which absorbs shocks by dampening the motion of the wheel 102 in the vertical direction as indicated by the arrows 140, 141 in Fig. 24. The shock absorber 138 improves the riding characteristics of the tricycle 100 and facilitates use in off-road and other adverse conditions. The various lockable pivots are similar to the fixedly pivotable joints A, B and C which have locking means 37 as described above.

Fig. 25 is a simplified view showing the first step in the process of folding the tricycle 100. The axle 106 as shown in Figure 25 includes a latch 144 which attaches the end 146 of the axle 106 to the central axle support 148. The axle 106 and the central axle support 148 are each tubular members and as shown in Fig. 26, the end 146 of the axle 106 has a portion 150 which projects into the opening 152 of the central axle support 146. The central axle support 148 is connected to the main frame 28 which has been previously described.

As shown in Fig. 25, the rear wheel 102 has been pivoted to a position which is generally in line with the axle 106.

Fig. 26 shows the axle 106 pivoted away from the central axle support 148, in the direction shown by the arrow 154, toward the front of the tricycle 100. The axle 106, the central axle support 148, and the main frame 28 are connected by the links 156.

Fig. 27 is a simplified front view of the tricycle 100 in which selected previously described links and pivots, which connect the rear wheels 102 and the axle 106, have been illustrated schematically by the broken lines 158. The axles 106 have been rotated in the directions shown by the arrows 154.

Fig. 27 shows the folded configuration of the tricycle 100 in which the rear wheels 102 are nearly in line with and nearly parallel to, the front wheel 14 thereby forming an extremely compact configuration.

Fig. 28 shows an alternate embodiment of the invention 200 which incorporates a set of gears 202, 204, 206 which connect the front fork 208 of the tricycle 200 with the seat 210. The front fork 208 is rotationally mounted on the longitudinal frame member 212 via a shaft 214, which is mounted in a bearing 216.

The front fork 208 supports the front wheel 218 which is mounted on an axle 220 and the rear wheels 222 are mounted on the transverse frame member 224 via axle 226. The top 228 of the shaft 214 is connected to the gear 202. The gear 202 is in mesh with the idler gear 204 which is mounted on the longitudinal frame member 212 via a shaft 230 and a bearing 232. The idler gear 204 in turn is in mesh with the sector gear 206. The sector gear 206 is mounted on the longitudinal frame member 212 via a shaft 234 and a bearing 236. The sector gear 206 is connected to the seat 210 via a seat support bracket 240. The sector gear 206, the idler gear 204, and the gear 202 may be spur gears.

Motion of the rider's body causes rotation of the seat 210 as indicated by the arrows 242, 244 in Fig. 32 causes rotation of the gears 202, 204, 206 and consequent rotation of the front fork 208 and steering control of the tricycle 200. The use of the idler gear 204 enables the rider to steer towards the right by turning to the right and alternatively steer towards the left by turning towards the left.

Fig. 33 shows yet another alternative embodiment of the invention in which the seat 502 is mounted on support shafts 504, 505 which are supported in bearings 506, 507 which are located on the apex 508 of a triangular frame 510 as shown in Fig. 35.

Seat support member 513 is pivotally mounted on the support shaft 505 and is connected to a front fork member 514 by a pair of links 516, 518. The links 516, 518 are connected to the seat support members 512, 513 and the front fork member 514 by pivots 520, 522, 524, 525, 526, and 527.

The triangular frame 510 includes three frame members 528, 530, 532 which support the rear axle 534 and rear wheels 536 as is shown in Fig. 35.

Rotation or leaning of the rider's body to the right causes the tricycle 500 to steer to the right by turning the front fork 538 and the front wheel 540 to the right. Similarly, rotation or leaning of the rider's body to the left causes the tricycle 500 to steer to the left.

Figs. 36 and 37 show another embodiment of the invention 600 which incorporates a downwardly directed front fork 602 and a frame assembly 604. The frame members 606, 608 of frame assembly 602, when viewed as in Fig. 37, have the general configuration of a capital letter V. The rear wheels, one of which is designated by the reference numeral 610 in Fig. 36, are mounted in bearings, one of which is designated by reference numerals 611, which are mounted in bearing blocks 612, 614. The front fork

602 is connected to a seat support shaft 616 which is pivotally mounted in a bearing 618 which is supported in a frame block 620. The seat support shaft 616 has a first portion 622 which is in general alignment with the downwardly directed front fork 602 and a second portion 624 which projects in an upward direction as is shown in Fig. 36 to support the seat 626.

Swiveling of the seat to the left and turning or leaning of the rider's body to the right turns the tricycle 600 to the right. Similarly, swiveling of the seat to the right and turning or leaning to the left turns the tricycle 600 to the left.

Fig. 38 shows another alternative embodiment of the invention 300 which incorporates a pair of links 302, 304 which connect a front fork member 306 and a seat member 308. The links 302, 304 are connected to the front fork member 306 and the seat member 308 by pivots 310, 312, 314, 316.

The seat 318 is supported on the upper end 320 of a shaft 322 which is pivotally mounted on the longitudinal frame member 324. The seat member 308 is connected to the shaft 322 and rotation of the shaft 322 rotates seat member 308.

Motion or rotation of the rider's body while seated in the seat 318 in the directions shown by the arrows 242, 244 in Fig. 32 causes rotation of the front fork member 306 in the directions shown by the arrows 242, 244 and rotation of the front fork 346. The motion of the rider's body thus enables the rider to steer the tricycle 300. Rotation of the rider's body to the right causes the tricycle 300 to turn to the right and similarly rotation of the rider's body to the left causes the tricycle 300 to turn to the left.

Fig. 40 shows yet another embodiment 700 of the invention which is generally similar to the embodiment shown in Fig. 28 with the exception that a first gas spring or

air spring 702 is mounted on the seat stern 704 supporting the seat 706 and a second gas spring 708 is mounted on the frame 710 supporting the front fork 712. The air springs 702, 708 facilitate the adjustment of the position of the seat 706 and the position of the front fork 712 along the directions shown by the arrows 714, 716, 718, 720 in Fig. 40. The air springs 702, 708 also facilitate the adjustment of the spring rate thereby providing capability for adjustment of the stiffness or comfort level of the ride provided by the tricycle 700.

The gas springs 702, 708 may be provided as sealed units or, alternatively, they may be provided with connecting tube 722, 724 as shown in Fig. 40. The tubes 722, 724 are connected to the frame 710, which is a sealed hollow tubular unit. The frame 710 functions as an air frame or reservoir and is pressurized by a small air compressor 708, which is powered by an electric battery which is shown in broken lines 730 or, alternatively, the air compressor 728 may be powered by rotation of one of the wheels 732 of the tricycle 700 via a drive wheel 734 or similar driving connection.

Alternatively, the gas springs may be connected directly to the compressor. The use of gas springs 702, 708 has been shown by way of illustration in connection with the embodiment of the invention shown in Fig. 28. It is clear that the gas springs 702, 708 and the associated components connected to the gas springs 702, 708 may be used with each of the various embodiments of the present invention.

The foregoing specific embodiments of the present invention as set forth in the specification herein are for illustrative purposes only. Various deviations and modifications may be made within the spirit and scope of this invention without departing from the main theme thereof.